

AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) Method for producing an ultrabARRIER layer system through comprising vacuum coating on a substrate with a layer stack ~~that is embodied as comprising~~ an alternating layer system of smoothing layers and transparent ceramic layers, ~~but~~ and comprising at least one smoothing layer between two transparent ceramic layers, which transparent layers are applied by sputtering, ~~characterized in that during the deposition of the smoothing layer and~~ a monomer is admitted into an evacuated coating chamber in which a magnetron plasma is operated during deposition of the at least one smoothing layer.

2. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein, during the deposition of the at least one smoothing layer, the magnetron plasma is operated in a pulsed manner with a pulse frequency of 1 kHz to 300 kHz.

3. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein, to maintain the magnetron plasma during the deposition of the at least one smoothing layer, a magnetron is used that is equipped with a target that is made of a material that can be reactively converted with nitrogen or oxygen.

4. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein a double magnetron is used to maintain the plasma during the deposition of the at least one smoothing layer.

5. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein a noble gas is used as a working gas.

6. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein hydrocarbons, silanes, Si-organics or organometallics are admitted as monomers.

7. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein at least one of oxygen, nitrogen ~~and/or~~ and hydrogen is admitted as reactive gas in addition to the admission of monomers during the deposition of the at least one smoothing layer.

8. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein a process pressure of 0.1 Pa to 10 Pa is set during the deposition of the at least one smoothing layer.

9. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein the deposition of the transparent ceramic layers takes place through magnetron sputtering.

10. (Currently Amended) Method according to claim 9, ~~characterized in that~~ wherein the deposition of the transparent ceramic layers takes place through reactive magnetron sputtering, ~~whereby~~ and at least one of nitrogen, oxygen, ~~and/or~~ and hydrogen is admitted as reactive gas.

11. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein Al_2O_3 is deposited as a transparent ceramic layer.

12. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein SiO_2 is deposited as a transparent ceramic layer.

13. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein SiN is deposited as a transparent ceramic layer.

14. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein the coating ~~takes place~~ is performed on stationary substrates.

15. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein the coating ~~takes place~~ is performed on moving band-shaped substrates.

16. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein the substrate temperature is kept at below 200°C during the coating.

17. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein the coating ~~takes place~~ is performed on plastic substrates.

18. (Currently Amended) Method according to claim 1, ~~characterized in that~~
the wherein at least one of coating rates ~~and/or the~~ and substrate speed are is
adjusted such that plasma polymer layers are deposited as smoothing layers with
a layer thickness of 50 nm to 5 μm and transparent ceramic layers are deposited
with a layer thickness of 5 nm to 500 nm.

19. (Currently Amended) Method according to claim 1, ~~characterized in that~~
wherein the alternating layer system is deposited by ~~means of~~ a magnetron

arrangement in the plasma of which alternately a monomer and a reactive gas is admitted.

20. (Currently Amended) Method according to claim 19, ~~characterized in that~~ wherein the deposition of the alternating layer system takes place through the alternating admission of HMDSO and oxygen.

21. (Currently Amended) Method according to claim 19, ~~characterized in that~~ wherein, during the deposition of the alternating layer system, the flows of monomer and reactive gas and/or working gas admitted are gradually changed and at least at times occur simultaneously so that individual layers of the alternating layer system merge into one another in a gradient form.

22. (Currently Amended) Method according to claim 19, ~~characterized in that~~ wherein reactive gas and monomer are admitted via a common gas intake.

23. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein the alternating layer system is deposited by ~~means of~~ at least one magnetron arrangement and the admission of monomer and reactive gas and/or working gas takes place at different sites so that the layers of the alternating layer system are deposited successively when passing through ~~the~~ a coating region on a moving substrate.

24. (Currently Amended) Method according to claim 1, ~~characterized in that~~ wherein the alternating layer system is deposited by ~~means of~~ at least one magnetron arrangement and the admission of monomer and reactive gas and/or working gas takes place at different sites so that a clear partial pressure gradient between the admitted gases develops in the region of the magnetron plasma

such that when passing through the coating region on a moving substrate layers are successively deposited which merge into one another in a gradient form.

25. (Currently Amended) Method according to claim 23, ~~characterized in that~~ wherein the substrate comprises a moving substrate ~~is~~ guided through the coating region several times.

26. (Currently Amended) Method according to claim 23, ~~characterized in that~~ wherein the deposition of the alternating layer system takes place through the simultaneous admission of HMDSO and oxygen.

27. (Currently Amended) Method according to claim 23, ~~characterized in that~~ wherein reactive gas and working gas are admitted via a common gas intake